



Electrical FAQ for Web July 2015

1. Question: I have a question concerning the 8' rule for service entrance conductors.

SPS 316.230.3(b) limits the length of "service entrance cable not contained within a raceway" to 8-feet once the cable has entered the building. Do we count the total conductor length including the stripped ends of the cable?

Answer: No. Measure the unstripped length of the cable similar to measuring along the length of a raceway. The length of the conductors located within enclosures is not included in the measurement. SPS 316.230.3(b) Reads: This is a department rule in addition to the requirements of NEC 230.70 (A): Raceways containing service conductors or cables, or service entrance cable not contained within a raceway, may not extend longer than 8 feet into a building to the service disconnect or the first service disconnect of a group of disconnects as permitted by NEC 230.71. The raceways or conductors shall be considered to have entered the building at the point where they pass through the outer surface of the building exterior, except as permitted by NEC 230.6."

2. Question: I have a home built in '03 and they want to finish the basement. The current ceiling boxes are not fan rated and don't remember when that became a requirement. They're leaving the lighting alone, but are adding outlets and I am debating about having them change the ceiling boxes. Are fan rated ceiling boxes required for this alteration?

Answer: Yes. Fan Boxes are required. What is now SPS 316.314 (2) required listed fan boxes in "habitable" rooms since 9-1-1996.

SPS 320.04 (2) shall also be used to determine compliance and indicates:

(2) ADDITIONS AND ALTERATIONS. Additions and alterations to dwellings covered by this code shall comply with all provisions of this code at the time of permit application or the beginning of the project, if no permit is required."

This section would require the installation to comply with the code requirements in effect at the time they turn unfinished space into habitable space.

3. Question: How many receptacles are required on the outside of a one- family dwelling? What about a side-by-side two-family dwelling?

**Answer: Two for a one-family Dwelling. Four for a side-by-side two-family dwelling.
NEC 210.52(E)(1)**

NEC 210.52(E)(1) lists the requirements. At least one on the front and one on the back of a one family dwelling and each unit of a two family dwelling that is at grade level. The receptacle outlets must be accessible while standing at grade level and located not more than 6 ½ feet above grade.

4. Question: We wired a new home. One-half of the lower level is finished and used as habitable rooms. The other one-half is unfinished. The exterior walls are insulated and covered with drywall. The builder had us install two receptacles in the walls in the unfinished space. The building inspector is holding up occupancy because he says more receptacles are required. Does the drywall make it finished?

Answer: No.

NEC 210.52(A)

The use of the space governs applicable requirements.

Your question asks us to define a finished basement. Dry walling the exterior walls of a basement does not in itself make the basement “finished”.

Some questions that need to be asked on a case by case basis are:

- * What does the plans/prints specify the space to be?**
- * What does the owner of the premises deem the space as?**
- * What is the intended use of the space?**

If the print/plans specify the space as a recreation or other habitable room, and the owner intends to use the space as such, then NEC 210.52 applies regardless of the wall surface material.

Additional receptacles in the unfinished spaces can and will be required to be installed once the owner decides to finish the rest of the space

5. Question: A 60-ampere feeder from the house supplies a 100 amp panel installed in the garage. Is it OK that the main in the garage panels is rated higher? The electrical contractor ran the required 4 wires to the panel but isn't there still the requirement of having a grounding electrode conductor?

Answer: Yes, the minimum rating of the panel in the garage is 60-amperes per NEC 225.39(D). No issues with a rating higher than the 50-ampere rating of the feeder. This is assuming the feeder conductors are allowed to be protected at 50-amperes and adequate for the calculated load.

Two ground rods or similar electrode are required at the garage. The requirement for an electrode system at the separate building is NEC 250.32(A). The exception in NEC 250.32(A) only applies to supply consisting of a single branch circuit.

6. Question: I questioned a contractor about the way they connected dishwashers in a new multi-family dwelling building. They located a switch above the counter top as the required disconnect. They then run NM cable through framing to the dishwasher location and extend a length through a hole in the drywall at the DW location. When the DW is installed they put a NM connector in the DW junction box, strip off the end make connections and coil up the excess under the dishwasher. Am I being too critical?

Answer: This installation method is not permitted by the NEC. The securing and supporting rules in NEC 334.30 & 334.15 for exposed work are not being followed. Typically contractors are using a flexible cord installed to meet NEC 422.16(B)(2) in many areas of the State.

7. Question: Does a GFCI receptacle installed for a drinking fountain (bubbler) need to be readily accessible?

Answer: No.

Code Reference: NEC 422.52, 210.8

All GFCI devices need to be in an accessible location for testing purposes. The requirement for ready access applies only to those locations listed in 210.8. GFCI protection for “Electric Drinking Fountains” is required for 422.52. A GFCI receptacle that is located under the drinking fountain would be considered readily accessible. A GFCI device located within the enclosure that can be accessed after installation for testing meets the current requirements.

8. Question: A radon mitigation fan is located on the exterior of a home. Does a disconnecting mean have to be located on the outside of the home as well?

Answer: Yes.

Code Reference: NEC 430.102(B), & Article 100 Definition

A disconnect shall be provided for the radon mitigation fan. The disconnect for the motor must be within sight from the motor location.

A properly rated snap switch in a weather-tight enclosure is one option. NEC 430.109(C) permits a general use switch as the disconnect for motors 2 HP or less. The ampere-rating of the switch must be at least twice the full-load current rating of the motor.

An AC-only switch must have an ampere rating of at least 125% of the motor full load current.

The branch-circuit circuit-breaker to serve as the required disconnect but only where the motor is rated 1/8 HP or less.

9. Question: I have an electrical question that involves a "service pit/ramp". We are wiring an addition to a service garage. The new service bays will have what they are calling a ramp. Basically it is a service pit with an open end. The open end will also extend into a service area so that they may work on the trucks from underneath. And store their tools, supplies, and spare parts at that lower level. Does the service area have to be classified the same as the pit? Venting the pit is not likely.

Answer: You indicated they will not likely ventilate the pit. Therefore entire area open to the pit must be classified the same as the pit. On the plus side, you must base the classification of the pit based upon the use. NEC 511.1 indicates the requirements apply to vehicles in which "volatile flammable liquids or flammable gases" are used for the fuel. Gasoline, natural gas, and LNG are flammable liquids or gasses respectively. Diesel fuel is a combustible liquid.

If the owner indicates only diesel-fueled vehicles will be serviced in the garage, get that in writing. Consult with the local AHJ including electrical and fire officials. They will be approving the project and may be familiar with the current use of the facility.

10. Question: Are tattoo parlors licensed as health care providers? Does NEC Article 517 apply to tattoo parlors?

Answer: No.

The term "Health care provider" is defined in State of Wisconsin State Statute 146.81.

Tattoos for cosmetic purposes may be given by other individuals that are licensed but not as a "Health Care Provider". Examples of such licenses are aesthetician, cosmetologist, and manicurists. Cosmetic purposes is defined under ss 454.01 (2), (13) WI Stats. NEC Article 517 applies only to facilities licensed as a health care provider.

11. Question: Can I connect loads to the Life Safety, Critical, and Equipment Branch in a hospital if they are not specifically called out in the Code?

Answer: Generally No.

Code Reference: NEC 517.32(A)

NEC 517.32(A) Life Safety Branch, Page 447, "No function other than those listed in 517.32(A) through (H) shall be connected to the life safety branch."

NEC 517.33(A) Critical Branch, Page 448, "The critical branch of the emergency system shall supply power for task illumination, fixed equipment, selected receptacles, and special power circuits serving the following areas and functions related to patient care: "(9) Additional task illumination, receptacles, and selected power circuits needed for effective hospital operation."

NEC 517.34 Equipment System Connection to Alternate Power Source, page 448. "...such that the equipment described in 517.34 (A) is automatically restored to operation...also provide for the subsequent connection of equipment described in 517.34(B)

Meet most restrictive requirement. For LS and CB, follow 517.30(A) and Article 700. For Equipment branch, follow Article 701.

12. Question: A Hot Tub is to be installed outdoors under utility conductors. A roof is to be installed over the hot tub to keep rain, snow, etc... off the occupant's while using the tub. There are no plans to install walls, only the columns to hold the roof structure over the tub. Would the owner still have to move the overhead service conductors to comply with NEC Table 680.8? Would the answer be different if walls are constructed isolating the tub?

Answer: The utility conductors are required to be moved. This Hot Tub is considered outdoors. This enclosure has no walls, only columns. The space is deemed an exterior/outdoor location. The space is also unheated, and is exposed to the elements. NEC Table 680.8 would apply. With no walls and exposed on all four sides, the overhead utility conductors present a potential danger to the occupants. All of the requirements of article NEC 680.42 apply to this outdoor hot tub installation.

If walls are constructed isolating the tub, the tub would be considered indoors and the utility conductors would not be required to be re-located. The indoor tub would be wired per NEC Article 680 indoor hot tub requirements.

13. Question: We are bidding a new generator installation for a house with a 200-ampere service. The generator will be equipped with an automatic transfer switch. Does the output of the generator have to be 200-amperes?

Answer: It depends on the load to be supplied.

Code Reference: NEC 702.4(B)

NEC 702.4(B) indicates the generator needs to be sized for the calculated load to be supplied. One option is to use manual transfer equipment. In this case, the generator and transfer equipment can be sized for only the items to be selected by the owner. The second alternative is an ATS. In this case, the generator would have to automatically pick up the entire connected load at one time. So the Code tells us that for automatic transfer equipment the minimum size of the generator is the total load that will be transferred by the automatic transfer equipment. The Code does offer one other alternative. A load management system can be used to automatically shed non-essential loads. This allows for a smaller generator size. A typical residential transfer switch would not be equipped with this feature.

14. Question: We are doing a job where they have provided us with the following specification:

All cables and connections for the fire alarm and detection system must have a 60-minute fire resistance.

There does not appear to be a cable that is rated 1 hour. I found the FPLR-CI which is 2-hour hour rated. The customer is requesting the regular FPLR cable. Can I run the FPLR run through fire-rated floors and walls to meet the 1 HR requirement?

Answer: If the specification calls for a fire rated cable, Type FPL-CI cable may be your only option.

The listing standard for Type FPL-CI requires a minimum 2 hour rating be established. If the building code requirement is only for one-hour protection, there are other options such as a 1 HR fire-rated protective system or construction. The architect should be able to assist you with this determination.

15. Question: I have a new home with a room above the garage. The entrance for the stairway to the room is in the garage. The room is dry walled, has a plywood floor but no heat. Not sure if the room is wired with the 6 foot 12 foot rule. Am I required to install an arc-fault breaker for the wiring in this room? It was labeled as a bonus room. Do I consider this area to be a closet, or similar area of the home?

Answer: This Bonus Room is similar to a Rec. room. When the bonus room is finished (dry walled) NEC 210.52(A) 210.12(A) & 210.70(A) will apply.